

# Mathematics Competition

*Problem #1: September 12, 2014 to September 19, 2014*

A professor makes a prediction about the number of students  $N$  in attendance that day at his lecture. This number is tested against six inequalities:

- $N < 10$  and  $N > 10$ ;
- $N < 20$  and  $N > 20$ ;
- $N < 30$  and  $N > 30$ .

When the  $N$  students finally came to lecture, the professor wrote next to each inequality whether it was true or false, and found that some 4 of the 6 inequalities were false. Find all possible  $N$  for which this could occur (i.e., give a list of all such values  $N$ ).

*Direct any questions to  
Gregory Galperin, OM 3361  
or David Cook II, OM 3216*

## Rules & Rewards

- Any undergraduate currently enrolled at EIU is eligible to participate.
- Each solution is to be the work of one individual and is to be submitted with the solver's name, year in school, email address, local address, and home address.
- Each solution is to be written or typed and is due in the main Mathematics Department office (OM 3611) by 2:00 p.m., Friday, September 19, 2014.
- Entries will be judged on the basis of clarity of exposition and elegance of the solution. That is to say, the *explanation* is more important than the answer.
- An award of \$20 will be given for the best solution. In the case of a two-way tie, the award will be evenly split. If there are more than two 'best' solutions, a drawing will be held for the award. In the case no award is made for this week's challenge, \$20 will be added to the next week's award.
- Names of all solvers will be posted on the Challenge of the Week bulletin board and on the Challenge of the week homepage: <http://www.eiu.edu/math/challenge.php>